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Case Report

Sudden death due to pulmonary aspergillosis

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Abstract

Sudden death due to respiratory pathology is not uncommon and tuberculosis with its complications is well known to cause death. We report a case of a male, train passenger, who started coughing out blood and died on reaching the hospital. Medicolegal autopsy confirmed the sudden unexpected death to be due to pulmonary aspergillosis in the person with past medical history of tuberculosis.

Keywords: Sudden death; Pulmonary tuberculosis; Pulmonary aspergillosis; Haemoptysis

1. Introduction

Forensic pathologists deal not only with criminal, accidental and suicidal deaths, but also with a wide range of natural deaths, especially, if they had occurred suddenly in apparently healthy individuals. Many of these deaths are sudden, unexpected, clinically unexplained or obscure; even though there may not be any criminal element in their causation. Some of the most difficult problems in criminal and litigious cases arise not out of gross, rapidly fatal trauma, but in deaths where concurrent natural disease or complications after trauma lead to a fatal outcome.[1] Suspicion usually arises when an individual is found dead, without anyone having witnessed the death.

Disease of any body system can result in sudden death. Tuberculosis (TB) remains a major respiratory cause of morbidity and mortality worldwide and has been identified as a 'global emergency' by the WHO.[2] Sporadic cases of sudden death due to TB are reported. Reasons for increasing incidence of disease are HIV infection, drug resistance, lack of access to health care, ineffective preventive and control programmes, etc.[3] Even after complete cure of the disease, TB leaves behind sequalae and complications like tuberculoma, cavitations, bronchiectesis, Rasmussen's aneurysm, lymphnode calcification, chronic empyema, pneumothorax, and opportunistic infections like aspergillosis, etc.

Aspergillus is a ubiquitous, filamentous, opportunistic infectious fungus found in soil and organic debris, however, only a few species of aspergillus are pathogenic to humans. The spectrum of pulmonary disease in humans ranges from aspergilloma to invasive pulmonary aspergillosis and allergic bronchopulmonary aspergillosis.[4] Visualisation of regular, dichotomously branching, septate hyphae with unequivocal evidence of tissue infiltration is necessary for classification as invasive aspergillosis.[5] Aspergillus assumes mycelia forms in lesions. Aspergillomas

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occur in patients with preexisting pulmonary cavities, such as those with a history of TB. Invasive aspergillosis is limited to immunocompromised hosts, particularly those with diabetes or leukemia-associated neutrophil defects and patients receiving steroid treatment.[4] In aspergillosis, the fungi preferentially localize in the lungs, from where they may disseminate. Aspergillus species cause a nondistinctive, suppurative, sometimes granulomatous, reaction with a predilection for invading blood vessel walls, causing vascular necrosis and infarction.[6] We report a case of sudden unexpected death due to pulmonary aspergillosis in an old case of TB.

2. Case report

As per the history obtained from preliminary investigations, the deceased, a 35-year-old male, and a known TB patient, who was asymptomatic since last one year, had repeated attacks of haemoptysis while traveling in a train. His condition deteriorated and was shifted to the hospital within an hour. He was declared dead on arrival and the body was subjected for a medicolegal autopsy on the same day.

2.1. External examination

The deceased was moderately built and poorly nourished. Blood stains were present over the oral and nasal orifices. Clubbing of fingers and toes was present (Fig. 1). No external injuries were present on the body.

2.2. Internal examination

Trachea and bronchi contained blood clots. Right sided pleural adhesions were present. Brain was congested and oedematous. Right lung weighed 675 g; surface was grayish black with bossilations. Lower lobe was hard in consistency. Cut sections revealed multiple grayish white areas in the upper lobe; the lower lobe showed multiple grayish black areas and multiple cavities containing foul smelling yellowish[d] black necrotic material (Fig. 2). Left lung weighed 500 g and was oedematous. Para-tracheal and hilar lymph nodes were enlarged and matted. Mesenteric lymph nodes were enlarged. Omental and mesenteric adhesions were present. Narrowing of the terminal ileum was seen. Stomach contained dark brown altered fluid blood. Other internal organs were pale.

Fig. 1. Clubbing of fingers and toes.

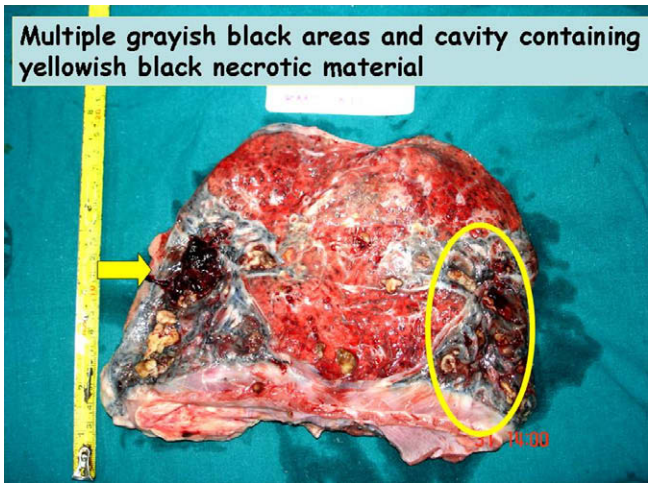

Fig. 2. Cut section of the lung showing grayish black areas and cavity containing yellowish black necrotic material.

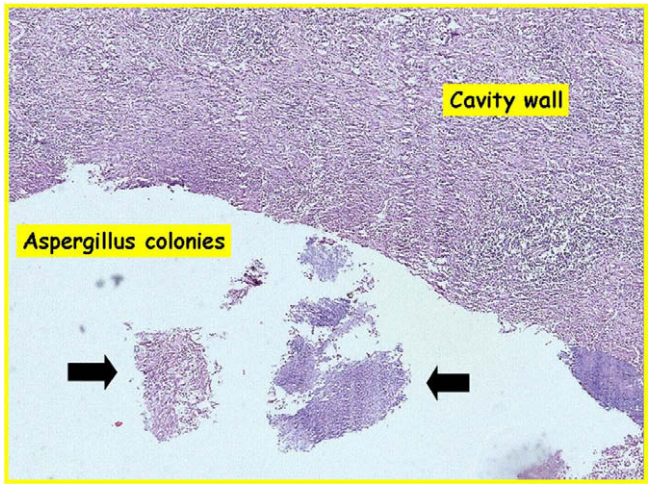

Fig. 3. Microscopy of the lung with Grocott's methanamine silver stain showing a cavity lined by fibrocollaginous tissue and colonized by Aspergillus.

2.3. Histopathology

Microscopy of the right lung using Grocott's methanamine silver stain showed a cavity lined by fibrocollaginous tissue and colonised by aspergillus (Fig. 3). Lung tissue

[d] For interpretation of color in Figures 1–3, the reader is referred to the web version of this article.

showed cystically dilated bronchioles with adjacent lymphoid follicles and extra-alveolar septae showing congested vessels. Peripheral oedema and haemorrhage were seen. No granulomas were identified in the multiple sections studied. Left lung showed oedema and haemorrhage.

It was diagnosed to be a case of old fibrocavitatory tuberculosis with Aspergillus colonization, and follicular bronchiectasis. No evidence of active TB was present. Histology of other organs showed no evidence of extrapulmonary tuberculosis. Cause of death was opined as haemorrhage secondary to pulmonary aspergillosis.

3. Discussion

Cases of TB related sudden deaths due to miliary tuberculosis, bronchiectasis, rupture of Rassmussen's aneurysm, tubercular myocarditis, TB of adrenal gland are reported.[1,7–11] Death from TB may sometimes have a rapid onset and progression. There are a number of reasons why TB cases are "missed" and are identified and reported at autopsy. Individuals may have had a concurrent condition masking TB; they may have been treated for TB in the past and suffered an unidentified reactivation; or they may have encountered socio-economic or cultural barriers to accessing health care. A case of a 60-year-old man who died from TB with no previous history of TB is reported.[12] In another case a 25-year-old person died suddenly due to myocardial TB while playing soccer.[13] Pulmonary TB is treatable, but deaths due to its complications are on the rise due to its association with HIV infection and evolution of multi drug resistant tubercle bacilli strains.

Invasive aspergillosis mostly affects immunocompromised patients, whereas pulmonary aspergilloma is a recognized complication of preexisting cavitatory lung disease in immunocompromised hosts. The most prevalent pathogens are *Aspergillus fumigates* and *Aspergillus flavus*.[14] The most important risk factors are neutropenia, prolonged corticosteroid therapy, organ transplant recipients, AIDS patients, haematologic malignancies, and chronic obstructive pulmonary disease. Invasive pulmonary aspergillosis can also occur in apparently non immunocompromised patients. Haemoptysis is the most common manifestation of an aspergilloma. Sputum sampling, bronchoalveolar lavage, serum immunoglobulin G aspergillus antibodies and CT scan are helpful in diagnosis. Systemic antifungal therapy is ineffective in patients with an aspergilloma, and standard of care is surgical resection.[4] Between 1980 and 1989, 32 cases of aspergillosis were identified in 2315 autopsies with an incidence of 1.4%. The incidence in immunocompromised high risk patients was 10.7%.[5] A case of fatal haemoptysis from invasive *Aspergillus niger* in a patient with cavitatory lung disease and Mycobacterium avium complex infection is reported.[14] Another case reports pulmonary aspergillosis soon after convalescence from pulmonary TB. Chest radiograph showed thickening of walls of large residual cavities with previous tubercular lesions and infiltrates around them. Autopsy findings showed pulmonary aspergillosis in and around the large cavities.[15] Pulmonary aspergillosis without haematological malignancy and immunosuppression can thus be abruptly severe and fatal due to malnourishment stemming from pre-existing conditions despite prompt medical treatment.

In our patient the sudden bout of haemoptysis may have been due to the Aspergillus species invading the blood vessel walls causing vascular necrosis. The host who was asymptomatic for nearly a year after treatment for pulmonary TB, suddenly coughed out blood and collapsed while traveling in a train. The possibility of opportunistic infections like pulmonary aspergillosis as the cause of sudden unexpected deaths should be explored at autopsy in countries where tuberculosis is endemic. In addition, the message to the clinicians is that care should be taken to periodically monitor old healed cases of TB for opportunistic infections.

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Conflict of interest

None declared.

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